

1. A conveying belt device comprising a loop structure of a
conductive loaded, resin-based material comprising
conductive materials in a base resin host wherein said belt
or fragments of said belt are detectable by a metal
5 detection device.

2.The device according to Claim 1 wherein the ratio, by
weight, of said conductive materials to said resin host is
between about 0.20 and about 0.40.

3.The device according to Claim 1 wherein said conductive
materials comprise metal powder.

4.The device according to Claim 3 wherein said metal powder
is nickel, copper, or silver.

5.The device according to Claim 3 wherein said metal powder
is a non-conductive material with a metal plating.

6.The device according to Claim 5 wherein said metal
plating is nickel, copper, silver, or alloys thereof.

7.The device according to Claim 3 wherein said metal powder
comprises a diameter of between about 3 μm and about 12 μm .

8.The device according to Claim 1 wherein said conductive materials comprise a combination of metal powder and non-metal powder.

9.The device according to Claim 1 wherein said conductive materials comprise micron conductive fiber.

10.The device according to Claim 9 wherein said micron conductive fiber is nickel plated carbon fiber, stainless steel fiber, copper fiber, silver fiber or combinations thereof.

11.The device according to Claim 10 wherein said micron conductive fiber has a diameter of between about 3 μm and about 12 μm and a length of between about 2 mm and about 14 mm.

12.The device according to Claim 1 wherein said conductive materials comprise a combination of conductive powder and conductive fiber.

13.The device according to Claim 1 wherein said conductive loaded resin-based material is a fabric.

14.The device according to Claim 1 wherein said device comprises a plurality of connected segments of said conductive loaded resin-based material.

15.The device according to Claim 14 further comprising a metal hinge embedded in each said segment.

16.The device according to Claim 1 wherein said base resin comprises a flame-retardant material.

17.The device according to Claim 1 further comprising a metal layer overlying said conductive loaded resin-based material.

18. A food processing conveying apparatus comprising:

a belt of a conductive loaded, resin-based material comprising conductive materials in a base resin host; and

a metal detector wherein said belt or fragments of
5 said belt are detectable by said metal detector.

19.The apparatus according to Claim 18 wherein the ratio, by weight, of said conductive materials to said resin host is between about 0.20 and about 0.40.

20.The apparatus according to Claim 18 wherein said conductive materials comprise metal powder.

21.The apparatus according to Claim 20 wherein said metal powder is a non-conductive material with a metal plating.

22.The apparatus according to Claim 18 wherein said conductive materials comprise a combination of metal powder and non-metal powder.

23.The apparatus according to Claim 18 wherein said conductive materials comprise micron conductive fiber.

24.The apparatus according to Claim 18 wherein said conductive materials comprise a combination of conductive powder and conductive fiber.

25.The apparatus according to Claim 18 wherein said conductive loaded resin-based material is a fabric.

26.The apparatus according to Claim 18 wherein said belt comprises a plurality of segments of said conductive loaded resin-based material.

27.The apparatus according to Claim 26 further comprising a metal hinge embedded in each said segment.

28.The apparatus according to Claim 26 further comprising a drive sprocket coupled to said belt wherein said drive sprocket comprises said conductive loaded resin-based material.

29.The apparatus according to Claim 18 wherein said belt comprises a continuous piece of said conductive loaded resin-based material formed by binding together to opposite ends of said conductive loaded resin-based material.

30.The apparatus according to Claim 29 wherein said binding is by ultrasonic welding.

31.The apparatus according to Claim 18 wherein said base resin comprises a flame-retardant material.

32.The apparatus according to Claim 18 further comprising a metal layer overlying said conductive loaded resin-based material.

33.The apparatus according to Claim 18 further comprising a chute or guide formed of said conductive loaded resin-based material.

34.A method to form a conveying belt device, said method comprising:

providing a conductive loaded, resin-based material comprising conductive materials in a resin-based host; and

5 molding said conductive loaded, resin-based material into a conveying belt device comprising a loop structure of a conductive loaded, resin-based material comprising conductive materials in a base resin host wherein said conveying belt or fragments of said conveying belt are
10 detectable by a metal detection device.

35.The method according to Claim 34 wherein the ratio, by weight, of said conductive materials to said resin host is between about 0.20 and about 0.40.

36.The method according to Claim 34 wherein the conductive materials comprise a conductive powder.

37.The method according to Claim 34 wherein said conductive materials comprise a micron conductive fiber.

38.The method according to Claim 34 wherein said conductive materials comprise a combination of conductive powder and conductive fiber.

39.The method according to Claim 34 wherein said molding comprises:

injecting said conductive loaded, resin-based material into a mold;

5 curing said conductive loaded, resin-based material;
and

removing said conveying belt device from said mold.

40. The method according to Claim 39 wherein said conveying belt device comprises a plurality of segments coupled together and wherein said step of molding comprises molding said segments.

41.The method according to Claim 40 further comprising placing a metal hinge in said mold prior to said step of injecting said conductive loaded, resin-based material into a mold.

42.The method according to Claim 34 wherein said molding comprises:

loading said conductive loaded, resin-based material into a chamber;

5 extruding said conductive loaded, resin-based material out of said chamber through a shaping outlet; and

curing said conductive loaded, resin-based material to form said conveying belt device.

43.The method according to Claim 42 further comprising bonding two ends of said molded conductive loaded resin-based material by ultrasonic welding.